REMARKS

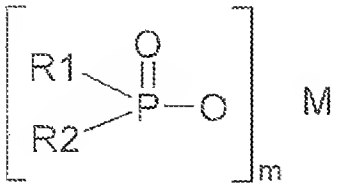
Responsive to the outstanding Office Action, applicant has carefully studied the Examiner's rejections and the comments relative thereto. Favorable reconsideration of the application is respectfully requested in light of the amendments and following detailed arguments. A request for a 1 month extension of time accompanies this amendment along with a Request for Continued Examination and an Information Disclosure Statement.

In the response, claim 11 has been amended, for clarity. Claim 11 has been amended in such a manner that the groups originally presented in claims 14-16 are clearly presented in the independent claim. It is respectfully submitted that no new matter has been presented in these amendments. Further, as this subject matter has already been presented, it is respectfully submitted that no new issues have been raised by this clarification.

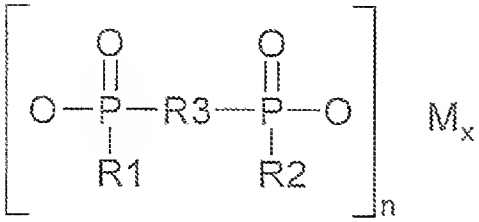
Rejections under 35 USC 103

Claims 11, 13, 17 and 19 are again rejected under 35 USC 103 as being unpatentable over Schlosser in view of Sicken, Sugino and Saga.

Independent claim 11 defines a flameproof polyamide molding compound. The compound comprises 20 - 80% by weight of one or more aliphatic polyamides and 1 - 40% by weight of one or more partly aromatic polyamides, which are selected from the group consisting of polyamides, the periodical units of which are derived from terephthalic acid and isophthalic acid and adipinic acid and also hexamethylene diamine, and 5 – 15% by weight of a flameproofing agent, containing a



(1)



(2)

phosphinic acid salt of formula (I) and/or a diphosphinic acid salt of formula (II) and/or polymers thereof. R^1, R^2 are the same or different and is C_1-C_6 alkyl, linear or branched, and/or aryl; and R^3 is C_1-C_{10} alkylene, linear or branched, C_6-C_{10} arylene, -alkyl arylene or aryl alkylene and M is metal ion from the 2nd or 3rd main or auxiliary group of the periodic table. Further m is 2 or 3, n is 1 or 3, and x is 1 or 2. The compound further comprises 5 - 60% by weight of a fibre- or particle-like filler or mixtures thereof and 0.05 - 10% by weight by additional additives wherein the sum of the proportions is 100% by weight. The additional additives are selected from the group consisting of anti-oxidants, light stability agents, lubricants, mold-release agents, nucleation agents, pigments, colorants and anti-dripping agents.

The Examiner opines that there the last response lacked a proper side-by-side comparison between the comparative examples and the inventive examples of present application since the amount of the aliphatic polyamides across all samples was not maintained. However, applicant respectfully traverses this estimation.

Comparative example 1 uses a polyamide a2 (polyamide 66) by 39.4 wt.-%, whereas examples 1 and 2 use the same polyamide in an amount of 43.0 and 47.4 wt.-%, respectively. The amount of the polyamide a2 being used in these examples therefore lies in a comparable size range. If the amount of the aliphatic polyamides from comparative example 2 compared with examples 3 and 4 is concerned, almost identical amounts of aliphatic polyamides are used. Comparative example 2 makes use of 39.4 wt.-% of a polyamide al (i.e. polyamide 6), whereas example 3 and example 4 use 40.0 wt.-% of polyamide I or a blend of two different aliphatic polyamides summing up to 37.4 wt.-%, respectively.

Therefore, the differences in the amounts of the aliphatic polyamides used throughout the examples are negligible. Due to the foregoing, a proper side-by-side comparison between the comparative examples and the examples according to present invention is possible.

The Examiner cites Schlosser et al. (US 6,547,992 B1) as the primary reference. Schlosser et al. disclose a polyamide molding composition comprising a flame retardant consisting of component A and component B as indicated in claim 1. Schlosser et al. do not teach the use of a blend of two types of different polyamides, nor the content of these different polyamides in the polyamide molding composition, nor the composition of the additional polyamide to be used (namely an aromatic polyamide as used by present invention). The invention according to Schlosser et al. is based on the findings that if additives (component B) are combined with metal phosphinates (components A), in appropriate amounts, a significant increase in the flame retardancy can be achieved (see col. 8, lines 17 to 20). The amount of flame retardant needed, based on the plastic

molding composition, to achieve V-O, V-1, and, respectively, V-2 classification can be reduced when the combination A+B is used, compared with A on its own (see col. 8, lines 26 to 30). Therefore, Schlosser et al. unambiguously teach that it is disadvantageous to use the flame retardant (component A, i.e. metal phosphinate) alone. Sufficient flame retardancy is only achieved if additional components B are present. Schlosser et al. demonstrate these findings in several comparative examples and examples according to their invention.

Schlosser et al. describes exactly the same comparative example as present invention (see col. 8, table 1, entry number 9: Polymer: glass-fiber-reinforced GR nylon 6,6 (see col. 7, lines 8 to 9), which contains 30 wt-% DEPAL = aluminium diethylphosphinate). This reference example used by Schlosser et al. is exactly the same as reference example 1 by present application. Also the same classification test was used (UL 94, wherein a test specimen with a thickness of 1.6 mmwas applied). The classification of this reference example also is V-2, which is the worst classification in this test method.

Schlosser et al. teach that, for example, polyamide compositions can be enhanced as far as their flame retardancy is concerned, if special additives are used (see for example table 5). In order to achieve the best classification of the UL94 test, still relatively high amounts of the flame retardant component A (i.e. the metal phosphinate) have to be used: If a lower content of the metal phosphinate is used (see for example entry 7 of table 5), the flame retardancy decreases to the classification V-1.

The present invention is based upon the finding that in flame retardant polyamide compositions, which contain one polyamide only as well as a diethylphosphinate as the

only flame retarding agent, a replacement of a part of the flame retardant by a second, different polyamide, leads to both an enhancement of the flame retardancy as well as an enhancement of selected mechanical properties, among others, e.g. the stress at failure as well as the breaking elongation. These findings were surprising and not foreseeable, since a person skilled in the art normally would have expected that the replacement of a certain amount of a flame retardant by a different polyamide, which per se is flammable, would result in increased flammability, and not increased flame retardancy. Reference also is made to the examples being contained in the present application, above all the comparison of the reference examples 1 and 2 with the examples 1 to 4 according to the invention respectively, which demonstrate these findings.

Therefore, the present invention improves flame retardant polyamide compositions, which are based upon alkyl-phosphinate as flame retardant, i.e. exactly the ones described by Schlosser et al, in a way that is opposite what should be expected by one skilled in the art.

From the above observations, it becomes obvious that the present invention differs from the teaching of Schlosser et al. by using a special mixture of different polyamides.

As already discussed above, the applicants surprisingly have found that by using a blend of two different polyamides, not only the flame retardancy, but also the mechanical properties of the polyamide moulding compositions can be enhanced simultaneously.

Therefore, the presently claimed invention improves flame retardant polyamide compositions as known from Schlosser et al. (i.e. polyamide compositions which are based upon one polyamide only and that use an alkylphosphinate as flame retardant) in order to improve both the flame retardancy as well as the mechanical properties. However, the applicants believe that the special technical effect, i.e. the substitution of certain amounts of the flame retardant agent (component c) according to present invention by aromatic polyamides is not disclosed in the prior art.

Schlosser et al. teach that the use of metal phosphinates as the only flame retardant is disadvantageous (see argumentation above and the reference cited therein). Therefore, Schlosser et al. teach away from present invention.

Sicken et al. (EP 0 584 567 A2, for the English equivalence see US 5,326,805) is directed to a flame-retardant plastic molding composition of improved stability, which, however, is based on olefin polymers. Therefore, the person skilled in the art would not derive any hint from this document to use aromatic polyamides for improving the flame retardancy of polyamide compositions.

Sugino et al. (US 5,895,607) disclose an electrically conductive casing for an electronic device made of a special polyamide mixture of a semi-aromatic polyamide and an aliphatic polyamide. The weight ratio of this polyamide blend lies in the range of 10:90 to 90:10. The polyamide compositions used for these casings preferably contain a flame retardant, which can be red phosphorus or mixtures of red phosphorus and inorganic compounds such as magnesium hydroxide, etc. (e.g. see col. 5, lines 44 to

55). However, Sugino et al. fails to disclose that metal phosphinates, as used by present invention and Schlosser et al., are suitable flame retardants for their polyamide compositions. On the one hand, therefore the teaching according to Sugino et al. is not comparable to the teaching according to Schlosser et al. since these compositions differ in the flame retardants. On the other hand, Sugino et al. does not disclose or render obvious the technical effect of an aromatic polyamide blended to an aliphatic polyamide, which is rendered flame retardant with metal phosphinates, namely that the aromatic polyamide acts as a flame retardant as well. Thus Sugino fails to overcome the defects in the primary reference.

Saga (US 2005/0113496 A1) describes flame retardant polyamide resin compositions, wherein the flame retardant is based on metal phosphinates according to formula I or formula II (see claim 1). These compositions, however, require a phenolic resin (component B) being present. However, phenolic resins are excluded from the present invention, so the compositions used in Saga do not disclose those claimed in the present invention. Furthermore, the flame retardants being used are present in a higher amount, namely 20 % by weight (see example 1 in table 1). The phenolic resin being present in the composition according to Saga acts as a char former when the compositions of the present invention are burnt and reduces the amount of moisture that is absorbed by the compositions. Therefore, Saga does not disclose the technical effects of the aromatic polyamide being present in the composition according to the invention, namely that the aromatic polyamide enhances the flame retardancy, which leads to the surprising finding that the flame retarding component, e.g. the metal phosphinates, can be reduced.

Applicants therefore submits that none of the cited documents that represent the state of the art, i.e. Sugino et al. (US 5,895,607) and Saga et al. (US 2005/0113496), render obvious this surprising finding that not only the flame retardancy but also the mechanical properties of the polyamide compositions are enhanced when on the one hand, the content of the flame retardant is lowered and on the other hand, a different polyamide is blended to this composition.

In view of the forgoing, it is respectfully submitted that no reasonable combination of the applied references yield the invention as claimed in claim 11. One skilled in the art would not come to the teachings of the present invention from the references cited.

Claims 13-15, 17 and 19, which depend directly or indirectly from independent claim 11, are believed to be allowable based, at least, upon this dependence.

Should the Examiner wish to modify the application in any way, applicant's attorney suggests a telephone interview in order to expedite the prosecution of the application.

Respectfully submitted,

Mark A. Hixon
Registration No. 44,766

ATTORNEYS
Marshall & Melhorn, LLC
Four SeaGate - 8th Floor
Toledo, Ohio 43604
(419) 249-7114
(419) 249-7151 Facsimile
Hixon@marshall-melhorn.com